Does A.M. Have a Tumour in the Pancreas? : Highlights of Analytical Chemistry in Switzerland

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Does A.M. Have a Tumour in the Pancreas?

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The aim of the clinical toxicological laboratory is to identify substances which might harm the patient. This may be the elucidation of an acute intoxication due to the intake of an overdose, the clarification of a chronic toxic process or the verification of an intake of substances which should not be taken by a patient.

Patients with recurring hypoglycaemia either have a deregulation in glucose metabolism, a tumour in the pancreas or take antidiabetic drugs without having diabetes.

A.M. was admitted to the hospital with recurring hypoglycaemic events in order to clarify the symptoms. One of the first tests performed is the fasting test, which does not allow the patient to eat during max. 72 h in order to evaluate the regulation of glucose metabolism. Regularly blood samples are taken to measure glucose concentration, different hormone levels, and in order to exclude the intake of antidiabetic drugs, a screening for these drugs should be offered. Thus A.M. had to fast and at the beginning and the end of the fasting test a blood sample was taken for the quantification of the antidiabetic drugs.

The laboratory therefore needs a fast, specific and sensitive analytical method for the quantitative determination of sulfonylurea drugs.

Due to their chemical structure the commonly used GC-MS methods used in clinical toxicological laboratories cannot be applied for the quantification of sulfonylurea drugs. Consequently, an HPLC-MS method has been developed using atmospheric pressure chemical ionisation and a chromatographic separation on a C18 column with ammonium carbonate buffer and acetonitrile as mobile phase. The plasma samples are extracted using solid-phase extraction. The subsequent HPLC-MS separation can identify and quantify the drugs in question due to their retention times and molecular masses.

In the serum of A.M. the antidiabetic drug glibenclamide was detected, which was intended for use by her husband only. She has no pancreatic tumour.

Applying this method on samples from patients with recurring hypoglycaemia helps to reduce costs for invasive diagnostic tools, which are necessary to look for tumours in the pancreas.

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Reference

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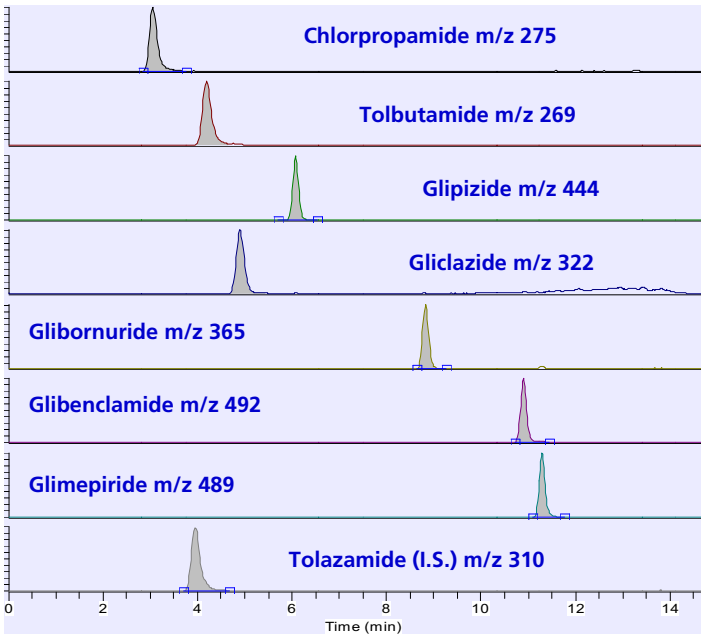
Blood samples being transferred to the centrifuge



HPLC-MS chromatograms showing the separation of the seven sulfonylurea drugs available in Switzerland

Can you show us your analytical highlight?
Please contact: Dr. Veronika R. Meyer, EMPA St.Gallen, Lerchenfeldstrasse 5, 9014 St.Gallen
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